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Exercise - I (Conceptual Questions) Build Up Your Understanding

MERISTEM TO VASCULAR BUNDLES

1. A meristem may be defined as the group of cells which -
(1) Does not divide
(2) Conserve food
(3) Divide continuously to give rise to new cells.
(4) Elongate, mature and add to the group of cells.

2. Histogens are components of -
(1) Apical meristem
(2) Intercalary meristem
(3) Lateral meristem
(4) Secondary meristem

3. In moncotyledon roots, the histogen present at the apex of the root tip is
(1) Dermatogen
(2) Procambium
(3) Calyptrogen
(4) Plerome

4. Root cap is not found in -
(1) Hollyhock (2) Pistia
(3) Sunflower (4) China rose

5. How many histogens are present in monocot root apex :
(1) 1 (2) 2 (3) 3 (4) 4

6. The secondary meristem originates from-
(1) Promeristem
(2) Primary meristem
(3) Primary permanent tissue
(4) Secretory tissue

7. The function of root cap is-
(1) Provide protection to root apex
(2) Storage of food products
(3) Absorption of nutrients
(4) None of the above

8. Meristem which is present inside the vascular bundle is –
(1) Apical meristem
(2) Intercalary meristem
(3) Cork cambium
(4) Intra fascicular cambium

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9. Aerenchyma is helpful to plants by –
(1) Providing buoyancy to hydrophytes
(2) Promoting photosynthesis
(3) Give mechanical strength to plants
(4) Giving flexibility to plants

10. Function of collenchyma is –
(1) Photosynthesis
(2) Mechanical support
(3) Both (1) and (2) (4) Secretion

11. In plants, which of the following cells are living
(1) Xylem vessels (2) Meristem
(3) Cork (4) Fibres

12. Which of the following tissues form the main bulk of storage organ-
(1) Parenchyma (2) Collenchyma
(3) Sclerenchyma (4) Aerenchyma

13. Grittness in pear fruit is due to
(1) Sclereids (2) Collenchyma
(3) Parenchyma (4) Meristem

14. Mechanical tissue consisting of living cells is -
(1) Sclerenchyma (2) Collenchyma
(3) Chlorenchyma (4) Parenchyma

15. Collenchyma differs from sclerenchyma in -
(1) Retaining protoplasm at maturity
(2) Having thick walls
(3) Having a wide lumen
(4) Being meristematic

16. Which of the following tissue provide tensile strength to young dicot stem against bending & swaying-
(1) Parenchyma (2) Collenchyma
(3) Sclerenchyma (4) Sclereids

17. Cell walls of sclerenchymatous cells are thickened due to deposition of -
(1) Cellulose (2) Pectin
(3) Lignin (4) Silica

18. Which of following plant cells are without vacuoles without nuclei and are dead -
(1) Cambium cells (2) Xylem vessels
(3) Root hairs (4) Companion cells

19. Maximum bordered pits are found in tracheids of
(1) Monocotyledons
(2) Dicotyledons
(3) Pteridophytes
(4) Gymnosperms

20. The cell functionally associated with sieve tube element is -
(1) Phloem fibres
(2) Phloem Parenchyma
(3) Companion cell
(4) Collenchyma

21. Bast fibres are mostly found in -
(1) Secondary xylem
(2) Secondary phloem
(3) Primary phloem
(4) Primary xylem

22. Vessels and companion cells are respectively present in the xylem and phloem of
(1) Gymnosperm (2) Pteridophyte
(3) Angiosperm (4) Bryophyta

23. Phloem parenchyma is absent in -
(1) Dicot stem (2) Dicot leaf
(3) Monocot stem (4) Dicot root

24. Localised cell wall thickenings in collenchyma is mainly due to deposition of -
(1) Cellulose (2) Pectin
(3) Lignin (4) Suberin

25. The chief function of a xylem vessel in a plant body is to -
(1) Conduct sap
(2) Conduct mineral salts only
(3) Eliminate excess of water at night
(4) Translocate organic nutrients

26. End walls of tracheids and vessels are, respectively
(1) Pitted & perforated
(2) Perforated & pitted
(3) Both perforated
(4) Both pitted

27. Long and pointed sclerenchyma cells are
(1) Fibres (2) Tracheae
(3) Wood parenchyma (4) Sclereids

28. Sieve tubes are characterised by
(1) Absence of septa
(2) Simple oblique septa
(3) Perforated longitudinal walls
(4) Perforated oblique septa (Sieve plate)

29. P-protein is a constituent of
(1) Sieve tube elements
(2) Xylem parenchyma
(3) Parenchyma (4) Pericycle

30. When xylem and phloem are on same radius, the vascular bundles are said to be -
(1) Radial (2) Conjoint
(3) Concentric (4) Exarch

31. A vascular bundle in which phloem is present on both the sides of the xylem and separated from it by strips of cambium is said to be -
(1) Collateral open (2) Bicollateral open
(3) Concentric (4) Bicollateral closed

32. A concentric amphivasal vascular bundle is that in which -
(1) Centrally located xylem is surrounded by phloem
(2) Centrally located phloem is surrounded by xylem
(3) Phloem is flanked by xylem on interior side only
(4) Xylem is flanked by phloem on exterior side only

33. Amphivasal vascular bundles are found in -
(1) *Cycas* and *Dryopteris*
(2) *Dracaena* and *Yucca*
(3) *Helianthus* and *Cucurbita*
(4) Maize and wheat

34. The basic difference between stem and root is that xylem in stem is -
(1) Endarch (2) Exarch
(3) Mesarch (4) Polyarch

35. Which xylem element is living :-
(1) Vessels (2) Tracheids
(3) Fibre (4) Parenchyma

36. Dead cells with narrow lumen, lignified cell wall with a few or numerous pits and serving a mechanical function only are called :-
(1) Collenchyma (2) Xylem
(3) Aerenchyma (4) Sclerenchyma

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37. Grittiness of fruit in pears is due to :-
(1) Presence of silica
(2) Presence of stone cells/sclereids
(3) Presence of raphids
(4) Formation of cystolith

38. Vessels are found in :-
(1) All angiosperms and some gymnosperm
(2) Most of the angiosperms and few gymnosperms
(3) All angiosperms, all gymnosperms and some pteridophyte
(4) All pteridophyte

39. The tracheids differ from vessels in having :-
(1) Lignified wall Tracheid
(2) Pits
(3) Presence of pitted end wall
(4) Spiral thickening

40. Sieve tube are best suited for translocation of solutes because :-
(1) They are much broader than long
(2) They possess no end wall
(3) They have higher number of pits
(4) It's sieve tube elements have interconnected lumen

41. Function of companion cells is to :-
(1) Provide energy to sieve elements for active transport
(2) Provide water to phloem
(3) Loading of sucrose into sieve elements by passive transport
(4) Loading of sucrose into sieve elements

PRIMARY INTERNAL STRUCTURE TO SECONDARY GROWTH

42. A tissue of epiphytes which is capable of absorbing water from air is known as -
(1) Cork (2) Velamen
(3) Epiblema (4) Hypodermis

43. Collenchymatous hypodermis is characteristic feature of -
(1) Dicot stem
(2) Monocot stem
(3) Monocot as well as dicot stem
(4) Hydrophytes

44. Innumerable (many) vascular bundles, lack of cambium and lack of a well demarcated pith is found in –
(1) Sugarcane, Grass (2) Sunflower, Neem
(3) Radish, Neem (4) Pea, Peepal

45. **Cortex** and **pith** are not distinguished in -
(1) Monocot stem (2) Monocot root
(3) Dicot stem (4) Dicot root

46. What is the characteristics of a vascular bundle of monocot stem -
(1) Open and surrounded by a sclerenchymatous bundle sheath
(2) Closed and not surrounded by bundle sheath
(3) Closed and surrounded by bundle sheath
(4) Open and not surrounded by a bundle sheath

47. In dicot root
(1) Vascular bundles are scattered with cambium
(2) Vascular bundles are open and arranged in a ring
(3) Xylem and pholem are radial
(4) Xylem is always endarch

48. A dicot root differs from a monocot root in which of the following-
(1) Presence of piliferous layer
(2) Presence of exodermis
(3) Presence of ill-developed (Poorly developed) pith
(4) Separate radial vascular bundle

49. Polyarch and exarch xylem is the characteristic of-
(1) Dicot stem (2) Dicot root
(3) Monocot stem (4) Monocot root

50. Water cavity & V or Y-shaped xylem occurs in
(1) Dicot stem (2) Monocot root
(3) Monocot stem (4) Dicot root

51. In which of the following order, an exarch xylem develops -
(1) Centripetal
(2) Centrifugal
(3) Both centripetal & centrifugal
(4) Irregular

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52. Vascular bundles in ***Cucurbita*** stem are -
(1) Bicollateral & open
(2) Bicollateral & closed
(3) Collateral & open
(4) Amphivasal

53. Position of xylem & phloem in leaf respectively -
(1) Abaxial & Adaxial (2) Adaxial & Abaxial
(3) Both Adaxial (4) Both abaxial

54. In dicot stem, hypodermis is
(1) Parenchymatous
(2) Sclerenchymatous
(3) Collenchymatous
(4) Chlorenchymatous

55. In leaves, the vascular bundles are
(1) Bicollateral & open (2) Collateral & open
(3) Collateral & closed (4) Radial & exarch

56. Vascular bundles are scattered in ground tissue (Atactostele) in -
(1) Maize stem (2) Sunflower stem
(3) Gram root (4) Isobilateral leaf

57. The hypodermis present in maize stem is -
(1) Parenchymatous (2) Collenchymatous
(3) Sclerenchymatous (4) Meristematic

58. Passage cells are found in endodermis of-
(1) Dicot stem (2) Monocot stem
(3) Orchid stem (4) Monocot root

59. Pith is produced by
(1) Ground meristem (2) Procambium
(3) Periblem (4) Dermatogen

60. Sugar transport elements of gymnosperms & pteridophytes are -
(1) Sieve cells
(2) Sieve elements
(3) Sieve tubes
(4) Sieve tube elements

61. When protoxylem faces pericycle, it is called
(1) Endarch (2) Mesarch
(3) Exarch (4) Polyarch

62. Which wood conduct sap -
(1) Heart wood
(2) Sap wood
(3) Wood with lots of fibres and tyloses
(4) All of the above

63. Phelloderm is formed by -
(1) Vascular cambium
(2) Phellogen
(3) Fascicular cambium
(4) Interfascicular cambium

64. Dendrochronology is the study of determination of-
(1) Height of a tree
(2) Diameter of a tree
(3) Age of a tree with the help of annual rings
(4) Counting of the number of branches

65. A timber merchant told his customer that log of wood which he was purchasing comes from a 20 years old tree, he told so by inspecting the -
(1) Diameter of log
(2) Thickness of the heart wood
(3) Number of cork layers
(4) Annual rings

66. In trees, the annual rings represent
(1) Primary xylem (2) Secondary xylem
(3) Secondary phloem (4) Cambium

67. Annual rings are the bands of-
(1) Secondary cortex and cork
(2) All secondary vascular tissue
(3) Secondary xylem and xylem rays
(4) Secondary phloem and medullary rays

68. Growth rings are formed due to the activity of-
(1) Intrastelar cambium
(2) Intercalary cambium
(3) Extrastelar cambium
(4) Primary cambium

69. When a tree grows older which of the following increased rapidly -
(1) Heart wood (2) Sap wood
(3) Pith (4) Cortex

70. Lenticels do not occur on-
(1) Stem (2) Root
(3) Leaf (4) Fruit

71. External protective tissues are -
(1) Cortex and epidermis
(2) Cork and pericycle
(3) Cortex and pericycle
(4) Cork and epidermis

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72. Which of the following provide maximum mechanical strength to a tree trunk.
(1) Heart wood (2) Sap wood
(3) Cork (4) Late wood

73. Extra stelar secondary growth in dicot stem occurs due to the activity of
(1) Intrafascicular cambium
(2) Interfascicular cambium
(3) Vascular cambium
(4) Cork cambium

74. Normally secondary growth takes place in -
(1) Dicots & Monocots
(2) Gymnosperms & Monocots
(3) Dicots & Gymnosperms
(4) Only in dicots

75. Formation of which tissue is example of dedifferentiation
(1) Interfascicular cambium
(2) Apical meristem
(3) Intrafascicular cambium
(4) Intercalary meristem

76. What happens to primary phloem in stem after sec growth
(1) Compresses outside and degenerates
(2) Compresses inside and degenerates
(3) Becomes part of sec phloem
(4) Modifies in sclerenchyma

77. Which tissue remains more active during spring
(1) Cork cambium
(2) Vascular cambium
(3) Parenchyma
(4) Sclerenchyma

78. Water conduction in stem of tree takes place mainly by-
(1) Duramen (2) Sapwood
(3) Primary xylem (4) All of the above

79. How many types of cells are present in vascular cambium of dicot stem
(1) Two types, fusiform & ray initial
(2) Only fusiform initial
(3) Only ray initial
(4) Three types fusiform, ray and medullary rays.

80. Cork cambium is
(1) Always primary meristem
(2) Always secondary meristem
(3) May be secondary or primary meristem
(4) Partly primary & partly secondary meristem

81. Normally in dicot stems, phellogen develops from
(1) Hypodermis
(2) Phellem
(3) Endodermal cells
(4) Epidermal & pericycle cells

82. Suberin in chiefly deposited in the cells of
(1) Sclerenchyma (2) Collenchyma
(3) Cork (4) Phelloderm

83. Which of the following is a meristematic tissue
(1) Phellem (2) Phellogen
(3) Phelloderm (4) Periderm

84. Sea shore trees do not show annual rings because
(1) There is little climatic variations
(2) They belong to monocots
(3) There is low temperature
(4) Soil is sandy

85. Secondary growth in dicots and gymnosperms occurs by
(1) Formation of vascular rays
(2) Thickening of tracheary elements
(3) Formation of meristematic cells in vascular region
(4) Development of meristematic cells in vascular & cortical regions

86. The balloon like outgrowths of parenchyma in the lumen of a vessel are known as
(1) Histogen (2) Tyloses
(3) Phellogen (4) Tunica

87. Which of the following tissues originate from ray initials of cambium
(1) Tracheids & vessels
(2) Sieve tubes & companion cells
(3) Xylem & phloem fibres
(4) Radial rows of parenchyma

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88. Cork is an excellent material for making bottle stopper because it is
(1) Cheap (2) Easily available
(3) Air tight (4) Light

89. In monocot stems, secondary growth cannot occur because vascular bundles are
(1) Scattered (2) Open
(3) Closed (4) Radial

90. Gymnosperm wood is non porous because it
(1) Lacks vessels
(2) Contains tracheae
(3) Has abundant fibres
(4) Contains no fibres

91. Porous wood is characterised by
(1) Absence of tracheids
(2) Presence of vessels
(3) Absence of vessels
(4) Presence of sieve-tubes

92. Outer part of bark is
(1) Epidermis (2) Rhytidome
(3) Phelloderm (4) Lenticel

93. Secondary growth is the production of
(1) New tissues from intercalary meristem
(2) New conduction cells
(3) New tissues from lateral meristem
(4) New ground cells

94. Each annual ring consists of two strips of
(1) Autumn & spring wood
(2) Heart wood & sap wood
(3) Xylem and phloem
(4) Cork & cortex

95. Intra fascicular cambium is situated
(1) In between the vascular bundles
(2) Inside the vascular bundles
(3) Outside the vascular bundles
(4) In pith

96. An example of monocots showing secondary growth in stem is
(1) ***Lilium*** (2) ***Pea***
(3) ***Asparagus*** (4) ***Yucca***

97. Vascular tissue having abundant vessels and fibres is
(1) Primary xylem (2) Secondary xylem
(3) Protoxylem (4) Metaxylem

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98. Monocot root is differ from dicot root in having :
(1) Open vascular bundle
(2) Scattered vascular bundle
(3) Large pith
(4) Radial vascular bundle

99. Autumn wood can be differentiated from spring wood by :-
(1) Broad vessels and tracheids
(2) Narrow vessels and tracheids
(3) Red colour of xylem
(4) Cambium

100. Vascular cambium forms :-
(1) Secondary xylem & Secondary phloem
(2) Primary xylem & Primary Phloem
(3) Only Secondary phloem
(4) Only Primary xylem

101. There is no result of 'Girdling Experiment' in monocot plants, due to :-
(1) Presence of wax layer on the surface of its stem
(2) Stem is comparatively thin
(3) Phloem is inside xylem
(4) Vascular bundles are not in specific position

102. Conjoint, Collateral, open vascular bundle and vascular bundles are arranged in a ring (Eustele) in :-
(1) Dicot stem (2) Monocot stem
(3) Monocot root (4) Dicot Root

103. Radial vascular bundles are found in :
(1) Only dicot root
(2) Only monocot root
(3) Only Pteridophyta
(4) Roots of vascular plants

104. Casparian strip is found in :-
(1) Epidermis (2) Endodermis
(3) Endothecium (4) Endothelium

105. Well developed pith is seen in :-
(1) Monocot root and monocot stem
(2) Dicot root and dicot stem
(3) Monocot root and dicot stem
(4) Dicot root and monocot stem

106. In dicot stem, starch sheath is equivalent to :-
(1) Hypodermis (2) Exodermis
(3) Endodermis (4) Epidermis

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107. TS of dicot stem is stained with iodine with proper procedure. Which of the following is expected to show blue colour?
(1) Endodermis (2) Hypodermis
(3) Pericycle (4) Phloem

108. In dorsiventral leaf, the location of palisade tissue and phloem respectively is :-
(1) Adaxial and abaxial
(2) Abaxial and adaxial
(3) Adaxial and adaxial
(4) Abaxial and abaxial

109. Large, empty, colourless cells found on adaxial epidermis on the leaves of grasses or the members of family Gramineae are :-
(1) Motor cells (2) Subsidiary cells
(3) Complimentary cells (4) Passage cells

110. Annual rings are bands of :-
(1) Secondary xylem and vascular rays
(2) Secondary phloem and vascular rays
(3) Secondary vascular tissues
(4) Cork and vascular cortex

111. Annual rings consist of :-
(1) Alternate rings of heart and early wood
(2) Alternate rings of sapwood and heart wood
(3) Alternate rings of early and late wood
(4) Alternate rings of porous and non-porous wood

112. Phellogen cuts :-
(1) Cork/phellogen inside and secondary cortex (phelloderm) outside
(2) Cork outside and phelloderm inside
(3) Both cork and phelloderm in inside
(4) Both cork and phelloderm outside

113. Bark includes :-
(1) All tissues exterior to vascular cambium
(2) Periderm and secondary phloem
(3) Both living and dead tissues
(4) All of these

EXERCISE-I (Conceptual Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	3	1	3	2	4	3	1	4	1	3	2	1	1	2	1
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	2	3	2	4	3	2	3	3	2	1	1	1	4	1	2
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	2	2	2	1	4	4	2	2	3	4	4	2	1	1	1
Question	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Answer	3	3	3	4	3	1	1	2	3	3	1	3	4	1	1
Question	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Answer	3	2	2	3	4	2	3	1	1	3	4	1	4	3	1
Question	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Answer	1	2	2	1	2	1	3	2	1	4	2	4	3	3	1
Question	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
Answer	2	2	3	1	2	4	2	3	2	1	4	1	4	2	3
Question	106	107	108	109	110	111	112	113							
Answer	3	1	1	1	1	3	2	4							

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Exercise - II (Previous Year Questions) AIPMT/NEET

AIPMT 2006

1. A common structural feature of vessel elements and sieve tube elements is :-
(1) Presence of p-protein
(2) Enucleate condition
(3) Thick secondary walls
(4) Pores on lateral walls

AIPMT 2007

2. For a critical study of secondary growth in plants, which one of the following pairs is suitable?
(1) Wheat and maiden hair fern
(2) Sugarcane and sunflower
(3) Teak and pine
(4) Deodar and fern

3. Passage cells are thin-walled cells found in:-
(1) Central region of style through which the pollen tube grows towards the ovary.
(2) Endodermis of roots facilitating rapid transport of water from cortex to pericycle
(3) Phloem elements that serve as entry points for substances for transport to other plant parts
(4) Testa of seeds to enable emergence of growing embryonic axis during seed germination.

AIPMT 2008

4. Vascular tissues in flowering plants develop from :
(1) Plerome (2) Periblem
(3) Dermatogen (4) Phellogen

5. The length of different internodes in a culm of sugarcane is variable because of :
(1) Position of axillary buds
(2) Size of leaf lamina at the node below each internode
(3) Intercalary meristem
(4) Shoot apical meristem

AIPMT 2009

6. In barley stem vascular bundles are :-
(1) Closed and radial
(2) Open and scattered
(3) Closed and scattered
(4) Open and in a ring

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7. Palisade parenchyma is *absent* in leaves of:-
(1) Gram (2) *Sorghum*
(3) Mustard (4) Soybean

8. Reduction in vascular tissue, mechanical tissue and cuticle is characteristic of :-
(1) Hydrophytes (2) Xerophytes
(3) Mesophytes (4) Epiphytes

9. Anatomically fairly old dicotyledonous root is distinguished from the dicotyledonous stem by :-
(1) Position of protoxylem
(2) Absence of secondary xylem
(3) Absence of secondary phloem
(4) Presence of cortex

AIPMT-Pre 2010

10. Which one of the following is *not* a lateral meristem?
(1) Intercalary meristem
(2) Intrafascicular cambium
(3) Interfascicular cambium
(4) Phellogen

11. The chief water conducting elements of xylem in gymnosperms are :
(1) Tracheids (2) Vessels
(3) Fibres (4) Transfusion tissue

12. Heartwood differs from sapwood in :
(1) Being susceptible to pests and pathogens
(2) Presence of rays and fibres
(3) Absence of vessels and parenchyma
(4) Having dead and non-conducting elements

AIPMT-Main 2010

13. Transport of food material in higher plants takes place through :
(1) Transfusion tissue (2) Tracheids
(3) Sieve elements (4) Companion cells

AIPMT-Pre 2011

14. Ground tissue includes :-
(1) All tissues external to endodermis
(2) All tissues except epidermis and vascular bundles
(3) Epidermis and cortex
(4) All tissues internal to endodermis

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15. The cork cambium, cork and secondary cortex are collectively called :-
(1) Phelloderm (2) Phellogen
(3) Periderm (4) Phellem

AIPMT-Main 2011

16. Function of companion cells is :
(1) Loading of sucrose into sieve elements.
(2) Providing energy to sieve elements for active transport.
(3) Providing water to phloem
(4) Loading of sucrose into sieve elements by passive transport.

17. Some vascular bundles are described as open because these :
(1) Are not surrounded by pericycle
(2) Are surrounded by pericycle but no endodermis
(3) Are capable of producing secondary xylem and phloem.
(4) Possess conjunctive tissue between xylem and phloem.

AIPMT-Pre 2012

18. Gymnosperms are also called soft wood spermatophytes because they lack :-
(1) Thick-walled tracheids
(2) Xylem fibres
(3) Cambium
(4) Phloem fibres

19. Water containing cavities in vascular bundles are found in :-
(1) *Cycas* (2) *Pinus*
(3) Sunflower (4) Maize

20. Closed vascular bundles lack :-
(1) Cambium
(2) Pith
(3) Ground tissue
(4) Conjuctive tissues

21. Companion cells are closely associated with:-
(1) Trichomes (2) Guard cells
(3) Sieve elements (4) Vessel elements

22. The common bottle cork is a product of :-
(1) Xylem
(2) Vascular Cambium
(3) Dermatogen
(4) Phellogen

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NEET-UG 2013

23. Age of a tree can be estimated by :
(1) Diameter of its heartwood
(2) Its height and girth
(3) Biomass
(4) Number of annual rings

24. Interfascicular cambium develops from the cells of:
(1) Pericycle (2) Medullary rays
(3) Xylem parenchyma (4) Endodermis

25. Lenticels are involved in :
(1) Photosynthesis (2) Transpiration
(3) Gaseous exchange (4) Food transport

AIPMT 2014

26. You are given a fairly old piece of dicot stem and a dicot root. Which of the following anatomical structures will you use to distinguish between the two?
(1) Secondary xylem
(2) Secondary phloem
(3) Protoxylem
(4) Cortical cells

27. Tracheids differ from other tracheary elements in:
(1) Having casparian strips
(2) Being imperforate
(3) Lacking nucleus
(4) Being lignified

AIPMT 2015

28. A major characteristic of the monocot root is the presence of :
(1) Scattered vascular bundles
(2) Vasculature without cambium
(3) Cambium sandwiched between phloem and xylem along the radius
(4) Open vascular bundles

29. In a ring girdled plant:
(1) The root dies first
(2) The shoot and root die together
(3) Neither root nor shoot will die
(4) The shoot dies first

30. Vascular bundles in monocotyledons are considered closed because:
(1) Cambium is absent
(2) There are no vessels with perforations
(3) Xylem is surrounded all around by phloem
(4) A bundle sheath surrounds each bundle

Re-AIPMT 2015

31. Read the different components from (a) to (d) in the list given below and tell the correct order of the components with reference to their arrangement from outer side to inner side in a woody dicot stem:
(a) Secondary cortex (b) Wood
(c) Secondary phloem (d) Phellem
The correct order is :
(1) (d), (c), (a), (b) (2) (c), (d), (b), (a)
(3) (a), (b), (d), (c) (4) (d), (a), (c), (b)

NEET-I 2016

32. Specialised epidermal cells surrounding the guard cells are called :-
(1) Complementary cells (2) Subsidiary cells
(3) Bulliform cells (4) Lenticels

NEET-II 2016

33. Cortex is the region found between :-
(1) Endodermis and pith
(2) Endodermis and vascular bundle
(3) Epidermis and stele
(4) Pericycle and endodermis

34. The balloon-shaped structures called tyloses :-
(1) Are extensions of xylem parenchyma cells into vessels
(2) Are linked to the ascent of sap through xylem vessels
(3) Originate in the lumen of vessels
(4) Characterize the sapwood

NEET(UG) 2017

35. The vascular cambium normally gives rise to
(1) Primary phloem (2) Secondary xylem
(3) Periderm (4) Phelloderm

36. Which of the following is made up of dead cells?
(1) Collenchyma (2) Phellem
(3) Phloem (4)Xylem parenchyma

37. Identify the wrong statement in context of heartwood:
(1) It is highly durable
(2) It conducts water and minerals efficiently
(3) It comprises dead elements with highly lignified walls
(4) Organic compounds are deposited in it

NEET(UG) 2018

38. Stomata in grass leaf are
(1) Dumb-bell shaped (2) Kidney shaped
(3) Rectangular (4) Barrel shaped

39. Secondary xylem and phloem in dicot stem are produced by
(1) Apical meristems
(2) Vascular cambium
(3) Phellogen
(4) Axillary meristems

40. Casparian strips occur in
(1) Epidermis (2) Pericycle
(3) Cortex (4) Endodermis

41. Plants having little or no secondary growth are
(1) Grasses
(2) Deciduous angiosperms
(3) Conifers
(4) Cycads

NEET(UG) 2019

42. Xylem translocates :-
(1) Water only
(2) Water and mineral salts only
(3) Water, mineral salts and some organic nitrogen only
(4) Water, mineral salts, some organic nitrogen and hormones

43. Grass leaves curl inwards during very dry weather. Select the most appropriate reason from the following :
(1) Closure of stomata
(2) Flaccidity of bulliform cells
(3) Shrinkage of air spaces in spongy mesophyll
(4) Tyloses in vessels

44. Phloem in gymnosperms lacks :
(1) Albuminous cells and sieve cells
(2) Sieve tubes only
(3) Companion cells only
(4) Both sieve tubes and companion cells

45. Which of the statements given below is **not** true about formation of Annual Rings in trees?
(1) Annual ring is a combination of spring wood and autumn wood produced in a year.
(2) Differential activity of cambium causes light and dark bands of tissue - early and late wood respectively
(3) Activity of cambium depends upon variation in climate.
(4) Annual rings are not prominent in trees of temperate region.

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NEET(UG) 2019 (Odisha)

46. In the dicot root the vascular cambium originates from :-
(1) Tissue located below the phloem bundles and a portion of pericycle tissue above protoxylem.
(2) Cortical region.
(3) Parenchyma between endodermis and pericycle.
(4) Intrafascicular and interfascicular tissue in a ring.

47. Regeneration of damaged growing grass following grazing is largely due to :-
(1) Lateral meristem (2) Apical meristem
(3) Intercalary meristem (4) Secondary meristem

NEET(UG) 2020

48. The transverse section of a plant shows following
anatomical features:
(a) Large number of scattered vascular bundles surrounded by bundle sheath.
(b) Large conspicuous parenchymatous ground tissue.
(c) Vascular bundles conjoint and closed.
(d) Phloem parenchyma absent.
Identify the category of plant and its part :-
(1) Dicotyledonous root
(2) Monocotyledonous stem
(3) Monocotyledonous root
(4) Dicotyledonous stem

49. Identify the **incorrect** statement.
(1) Due to deposition of tannins, resins, oils etc., heart wood is dark in colour
(2) Heart wood does not conduct water but gives mechanical support
(3) Sapwood is involved in conduction of water and minerals from root to leaf
(4) Sapwood is the innermost secondary xylem and is lighter in colour

NEET(UG) 2020 (COVID-19)

50. Large, empty colourless cells of the adaxial epidermis along the veins of grass leaves are
(1) Lenticels (2) Guard cells
(3) Bundle sheath cells (4) Bulliform cells

51. Which of the following statements about cork cambium is **incorrect**?
(1) It forms secondary cortex on its outerside
(2) It forms a part of periderm
(3) It is responsible for the formation of lenticels
(4) It is a couple of layers thick

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NEET(UG) 2021

52. Match **List-I** with **List-II.**

List -I		List - II	
(a)	Cells with active cell division capacity	(i)	Vascular tissues
(b)	Tissue having all cells similar in structure and function	(ii)	Meristematic tissue
(c)	Tissue having different types of cells	(iii)	Sclereids
(d)	Dead cells with highly thickened walls and narrow lumen	(iv)	Simple tissue

Select the **correct** answer from the options given below.

	(a)	**(b)**	**(c)**	**(d)**
(1)	(ii)	(iv)	(i)	(iii)
(2)	(iv)	(iii)	(ii)	(i)
(3)	(i)	(ii)	(iii)	(iv)
(4)	(iii)	(ii)	(iv)	(i)

53. Match **List -I** with **List - II.**

List -I		List - II	
(a)	Lenticels	(i)	Phellogen
(b)	Cork cambium	(ii)	Suberin deposition
(c)	Secondary cortex	(iii)	Exchange of gases
(d)	Cork	(iv)	Phelloderm

Choose the **correct** answer from the options given below.

	(a)	**(b)**	**(c)**	**(d)**
(1)	(iv)	(i)	(iii)	(ii)
(2)	(iii)	(i)	(iv)	(ii)
(3)	(ii)	(iii)	(iv)	(i)
(4)	(iv)	(ii)	(i)	(iii)

54. Select the **correct** pair.
(1) Large colorless empty cells in the epidermis of grass leaves – Subsidiary tissue
(2) In dicot leaves, vascular bundles are surrounded by large thick-walled cells – Conjunctive tissue
(3) Cells of medullary rays that form part of cambial ring – Interfascicular cambium
(4) Loose parenchyma cells rupturing the epidermis and forming a lens-shaped opening in bark – Spongy parenchyma

NEET(UG) 2022

55. Which of the following is **incorrectly** matched ?
(1) *Ulothrix* – Mannitol
(2) *Porphyra* - Floridian Starch
(3) *Volvox* – Starch
(4) *Ectocarpus* - Fucoxanthin

56. In old trees the greater part of secondary xylem is dark brown and resistant to insect attack due to:
(a) secretion of secondary metabolities and their deposition in the lumen of vessels.
(b) deposition of organic compounds like tannins and resins in the central layers of stem.
(c) deposition of suberin and aromatic substances in the outer layer of stem.
(d) deposition of tannins, gum, resin and aromatic substances in the peripheral layers of stem.
(e) presence of parenchyma cells, functionally active xylem elements and essential oils.
Choose the **correct answer** from the options given below:
(1) (c) and (d) Only (2) (d) and (e) Only
(3) (b) and (d) Only (4) (a) and (b) Only

57. The anatomy of springwood shows some peculiar features. Identify the **correct** set of statements about springwood.
(a) It is also called as the earlywood
(b) In spring season cambium produces xylem elements with narrow vessels
(c) It is lighter in colour
(d) The springwood along with autumnwood shows alternate concentric rings forming annual rings
(e) It has lower density
Choose the **correct answer** from the options given below:
(1) (a), (c), (d) and (e) Only
(2) (a), (b) and (d) Only
(3) (c), (d) and (e) Only
(4) (a), (b), (d) and (e) Only

Re-NEET(UG) 2022

58. Initiation of lateral roots and vascular cambium during secondary growth takes place in cells of :
(1) Epiblema (2) Cortex
(3) Endodermis (4) Pericycle

59. The type of tissue commonly found in the fruit wall of nuts is :
(1) Parenchyma (2) Collenchyma
(3) Sclerenchyma (4) Sclereid

EXERCISE-II (Previous Year Questions) ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	2	3	2	1	3	3	2	1	1	1	1	4	3	2	3
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	1	3	2	4	1	3	4	4	2	3	3	2	2	1	1
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	4	2	3	1	2	2	2	1	2	4	1	4	2	4	4
Question	46	47	48	49	50	51	52	53	54	55	56	57	58	59	
Answer	1	3	2	4	4	1	1	2	3	1	4	1	4	4	

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Exercise - III Master Your Understanding

EXERCISE-III (A) [NCERT BASED QUESTIONS]

1. Branch of botany related with study of internal structure of plants.
(1) Cytology (2) Anatomy
(3) Physiology (4) Ecology

2. A tissue is a group of cells having a
(1) Common origin and dissimilar in function.
(2) Dissimilar origin and common in function.
(3) Dissimilar origin and common in function
(4) Common origin and usually perfoming a common function.

3. In embryonic stage, cells are
(1) Collenchymatous (2) Sclerenchymatous
(3) Meristematic (4) Parenchymatous

4. Apical meristem is present
(1) At the tips of roots
(2) At the tips of shoots
(3) In buds which are present in axils of leaves
(4) All of the above

5. Which of the following is an example of primary meristem
(1) Phellogen
(2) Vascular cambium of root
(3) Inter fascicular cambium
(4) Intra fascicular cambium

6. Which of the following are examples of lateral meristems
(1) Fascicular vascular cambium
(2) Inter-fascicular cambium
(3) Cork cambium (4) All of the above

7. Example(s) of primary permanent tissue(s) is/are
(1) Parenchyma (2) Collenchyma
(3) Sclerenchyma (4) All of the above

8. Which of the following statement(s) is/are true about parenchyma?
(1) The cells are generally isodiametric
(2) The cells may either be closely packed or have intercellular spaces.
(3) It performs various functions like photosynthesis, storage & secretion.
(4) All of the above

9. Which of the following tissue provides mechanical support to the growing parts of the plant such as young stem and petiole of a leaf.
(1) Parenchyma (2) Collenchyma
(3) Sclereids (4) Fibres

10. Living elements of xylem is
(1) Tracheid (2) Vessel
(3) Xylem parenchyma (4) Xylem fibre

11. Companion cells are present in the phloem of
(1) Pteridophytes (2) Gymnosperms
(3) Angiosperms (4) Both 1 and 2

12. Vessels differ from tracheids in having
(1) In being living
(2) Presence of perforation plates at both ends
(3) Enucleated condition
(4) All of the above

13. Which of the following is/are bast fibre/s ?
(1) Jute (2) Flax
(3) Hemp (4) All of the above

14. When a meristematic tissue "Intra fascicular cambium" is present inside a vascular bundle, the vascular bundle is called
(1) Conjoint (2) Open
(3) Closed (4) Radial

15. Which of the following is not included in stomatal apparatus
(1) Stomatal aperture
(2) Guard cells
(3) Subsidiary cells
(4) Sclerenchymatous cells

16. Consider the following statements.
(a) Phloem fibres are made up of sclerenchymatous cells
(b) Phloem parenchyma are generally present in monocots
(c) The first formed primary phloem consists of narrow sieve tube and is referred to as protophloem and the later formed phloem has bigger sieve tubes and is referred to as metaphloem
Which statement(s) is/are false ?
(1) Only a (2) Only b
(3) Only c (4) a, b, and c

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17. The outside of the epidermis is often covered with a waxy thick layer, called
(1) Hypodermis (2) Cuticle
(3) Root hair (4) Stem hair

18. Cuticle is absent in
(1) Roots (2) Dicot Stem
(3) Leaves (4) Monocot stem

19. In which plant vascular bundles are scattered in ground tissue and each vascular bundle is surrounded by sclerenchymatous bundle sheath
(1) Maize (2) Sunflower
(3) Gram (4) Ficus

20. Pith is small or inconspicuous in
(1) Monocot root (2) Monocot stem
(3) Dicot root (4) Dicot stem

21. The dicot root is identified from the monocot root by the presence of
(1) Exarch xylem
(2) 2-4 xylem bundles
(3) > 6 xylem bundles
(4) Large and well developed pith

22. Parenchymatous cells with large intercellular spaces which occupy the central portion of the stem constitute
(1) Cortex (2) Pith
(3) Hypodermis (4) Epidermis

23. In grasses, certain adaxial epidermal cells along the veins modify themselves into large, empty, colourless cells. These cells are called
(1) Bulliform cells
(2) Starch sheath cells
(3) Companion cells
(4) Complimentary cells

24. In dicot stem, the cells of cambium present between primary xylem and primary phloem is the
(1) Interfascicular cambium
(2) Vascular cambium
(3) Intra fascicular cambium
(4) Cork cambium

25. The innermost layer of cortex of dicot root is characterised by presence of suberin thickening. This suberin thickening occurs on
(1) Radial walls (2) Transverse wall
(3) Tangential wall (4) Both 1 & 3

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26. The parenchymatous cells lies between xylem & phloem of root is known as
(1) Cambium (2)Conjunctive tissue
(3) Pith (4) Pericycle

27. Regarding to stele which of the following statement is correct ?
(1) All the tissues lies inner to pericycle
(2) All the tissues lies inner to endodermis
(3) All the tissues lies inner to hypodermis
(4) All the tissues lies inner to epidermis

28. Complimentary cells are formed by the activity of
(1) Vascular cambium
(2) Inter fascicular cambium
(3) Phellogen
(4) Intra fascicular cambium

29. Vascular cambium cuts off cells more
(1) Towards centre (2) Towards periphery
(3) Both (1) and (2) (4) None of these

30. In a dicot root, vascular cambium originates from
(1) Parenchymatous conjuctive tissue located just below phloem bundles
(2) Medullary rays
(3) A portion of pericycle tissue, lying opposite to protoxylem
(4) Both (1) and (3)

31. In a dicot root, the pericycle gives rise to
(1) Lateral roots
(2) Cork cambium
(3) A portion of vascular cambium
(4) All of the above

EXERCISE-III(B) [Analytical QUESTIONS]

32. Select true statement
(1) Lenticels occur in woody trees
(2) Bark is a non-technical term
(3) Vascular cambium and cork cambium are examples of lateral meristems
(4) All of the above

33. During secondary growth in dicot stem, At some places, the cambium forms a narrow band of parenchyma, which passes through the secondary xylem and secondary phloem in radial directions. These are called :-
(1) Sap wood
(2) Heart wood
(3) Secondary medullary rays
(4) Primary medullary rays

TG: @Chalnaayaaar

34. Bark that is formed early in the season is called
(1) Late bark (2) Soft bark
(3) Hard bark (4) Ring bark

35. At certain regions, the phellogen cuts off closely arranged parenchymatous cells on the outer side instead of cork cells. These are called :-
(1) Phellem
(2) Periderm
(3) Bark
(4) Complimentary cells

36. The cells of secondary cortex are :-
(1) Sclerenchymatous (2) Parenchymatous
(3) Collenchymatous (4) Meristematic

37. In dicot root, the vascular cambium is.
(1) Primary in origin
(2) Completely secondary in origin
(3) Both primary and secondary in origin
(4) Neither primary nor secondary in origin

38. Due to continuous growth of secondary xylem which of the following get crushed gradually
(1) Primary phloem
(2) Earlier formed secondary phloem
(3) Either 1 or 2
(4) Both (1) and (2)

39. After secondary growth what is the actual future of primary xylem ?
(1) Converts into secondary xylem
(2) Remains more or less intact in or around the centre
(3) Converts into secondary phloem
(4) Gets crushed

40. In plants, during early embryonic condition-
(1) All cells of the embryo divide
(2) Meristematic activity is confined to single apical cell
(3) Meristematic activity is confined to a group of apical cells.
(4) Apical & lateral cells only divide

41. Tissue which develops more due to scarcity of water or tissue which is lignified -
(1) Sclerenchyma (2) Collenchyma
(3) Parenchyma (4) Meristem

42. A mature sieve tube differs from a vessel -
(1) In lacking a functional nucleus
(2) Absence of lignified walls
(3) Being nearly dead
(4) Lacking cytoplasm

43. Sieve plates in angiosperms are -
(1) Oblique & in lateral walls
(2) Pitted & in end wall
(3) Oblique & in end wall
(4) Straight & in lateral wall

44. According to histogen theory, during apical organization three histogens are formed. The part differentiated by plerome is-
(1) Cortex
(2) Xylem & phloem
(3) Ground tissue system
(4) Stele

45. T.S. of a material exhibits conjoint, collateral endarch and closed bundles scattered in a ground tissue what should be the material -
(1) Monocot root (2) Dicot root
(3) Monocot stem (4) Dicot stem

46. In respect of many grasses, the presence of bulliform or motor cells in the upper epidermis of leaves is to:-
(1) Increase the surface area of the leaf
(2) Store large amount of water
(3) Check transpiration by reducing the surface area of the leaf
(4) Bear unicellular trichomes

47. Heart wood of most of the woody trees, fails to conduct sap due to the obstruction by ?
(1) Excess secondary wall deposition
(2) Storing a variety of material by tyloses
(3) Deposition of reserved food material
(4) Ray parenchyma

48. The trees growing in deserts will -
(1) Show alternate rings of xylem and sclerenchyma
(2) Show distinct annual rings
(3) Not show distinct annual rings
(4) Have only conjunctive tissue and phloem formed by the activity of cambium

49. Sap wood differ from heart wood in being -
(1) Darker and non-conducting
(2) Softer and non-conducting
(3) Lighter and conducting
(4) Harder, darker and less conducting

TG: @Chalnaayaaar

50. If a stem is girdled-
(1) Root dies first
(2) Shoot dies first
(3) Both die together
(4) None of the above die

51. Spring wood (early wood) differs with autumn wood (late wood) in -
(1) Size of vessels and tracheids
(2) Thickness of cell wall
(3) Amount of wood
(4) All the above

52. Most conspicuous annual rings are formed in
(1) Temperate evergreen plants
(2) Tropical deciduous
(3) Temperate deciduous plants
(4) Tropical evergreen

53. In dicot root which tissue becomes dead due to activity of phellogen
(1) All tissue outside cortex
(2) Tissue outside hypodermis
(3) Tissue outside endodermis
(4) Tissue outside pericycle

54. Physiologically functional part of wood is
(1) Heart wood only
(2) Sap wood only
(3) Only primary wood
(4) Both heart wood & sap wood

55. Which of the following is not a part of stomatal apparatus ?
(1) Stomatal aperture (2) Guard cells
(3) Lenticels (4) Subsidiary cells

56. Which is not correct about heartwood
(1) It is formed of living cells
(2) It contains resins, tannin and other organic contents
(3) It is of dark coloured
(4) It lies in the central region of secondary xylem

57. Outer lighter coloured region of wood of tree is
(1) Autumn wood (2) Spring wood
(3) Heart wood (4) Sap wood

58. After two or three years of secondary growth the cortex in dicot roots
(1) Remains intact
(2) Is completely sloughed away
(3) Is largely lost
(4) Is converted into cork

59. When secondary growth in thickness is initiated in a dicot root, which of the following happens first ?
(1) Cambial initials between xylem and phloem will divide
(2) Pericycle strands, outside the primary xylem will divide
(3) Periclinal division takes place, so that the cambium becomes circular
(4) Parenchymatous cells between xylem and phloem become meristematic

60. Complementary cells of lenticels are
(1) Compact and suberised
(2) Closely arranged and non suberised
(3) Compact and lignified
(4) Loose and lignified

61. In a woody dicotyledonous tree, which of the following parts will mainly consist of primary permanent tissues ?
(1) Stem and root
(2) All parts
(3) Shoot tips and root tips
(4) Flowers, fruits and leaves

62. The feature which is common to both heartwood and sapwood is
(1) Both are the regions of secondary xylem
(2) Both are involved in the conduction of water
(3) Both comprise dead elements with accumulation of aromatic compounds
(4) Both are located in the central layers of the stem

63. Which of the following is true for the dicot roots?
(1) Both vascular and cork cambium are responsible for the secondary growth
(2) Vascular cambium arises during the primary growth
(3) They do not show secondary growth like in monocot roots
(4) Cork cambium develops during the primary growth

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64. Given below are two statements:
Statement-I : During the formation of leaves and elongation of stems, some cells left behind from shoot apical meristem, constitute the axillary bud.
Statement-II : Fascicular vascular cambium, inter fascicular cambium and cork cambium are examples of lateral meristems.
In the light of the above statements, choose the most appropriate answer from the options given below:
(1) Both Statement-I and Statement-II are correct.
(2) Both Statement-I and statement-II are incorrect.
(3) Statement-I is correct but Statement-II is incorrect.
(4) Statement-I is incorrect but Statement-II is correct.

65. Given below are two statements:
Statement-I : Collenchyma occurs in layers below the epidermis in most of the monocotyledonous plants.
Statement-II : Sclereids are found in the fruit walls of nuts, pulp of fruits like guava, pear and sapota, seed coats of legumes and leaves of tea.
In the light of the above statements, choose the most appropriate answer from the options given below:
(1) Both Statement-I and Statement-II are correct.
(2) Both Statement-I and Statement-II are incorrect.
(3) Statement-I is correct but Statement-II is incorrect.
(4) Statement-I is incorrect but Statement-II is correct.

66. Given below are two statements:
Statement-I : In roots the arrangement of primary xylem is endarch and in stem it is exarch.
Statement-II : A mature sieve element possesses a peripheral cytoplasm and a large vacuole and a nucleus.
In the light of the above statements, choose the most appropriate answer from the options given below:
(1) Both Statement-I and Statement-II are correct.
(2) Both Statement-I and Statement-II are incorrect.
(3) Statement-I is correct but Statement-II is incorrect.
(4) Statement-I is incorrect but Statement-II is correct.

67. Given below are two statements:
Statement-I : In grasses, certain adaxial epidermal cells along with the veins modify themselves into large empty, colourless cells. These are called bulliform cells.
Statement-II : All tissues on the outerside of endodermis such as pericycle, vascular bundles and pith constitute the stele.
In the light of the above statements, choose the most appropriate answer from the options given below:
(1) Both Statement-I and Statement-II are correct.
(2) Both Statement-I and Statement-II are incorrect.
(3) Statement-I is correct but Statement-II is incorrect.
(4) Statement-I is incorrect but Statement-II is correct.

68. Given below are two statements:
Statement-I : In isobilateral leaf there is no differentiation into palisade and spongy parenchyma.
Statement-II : The spring wood is darker in colour and has a lower density whereas the autumn wood is lighter and has a higher density.
In the light of the above statements, choose the most appropriate answer from the options given below:
(1) Both Statement-I and Statement-II are correct.
(2) Both Statement-I and Statement-II are incorrect.
(3) Statement-I is correct but Statement-II is incorrect.
(4) Statement-I is incorrect but statement-II is correct.

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69. Given below are two statements: one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A) : In roots the arrangement of primary xylem is exarch.

Reason (R) : In roots, the protoxylem lies towards the centre (pith) and the metaxylem lies towards the primary of the organ.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) Both (A) & (R) are correct but (R) is not the correct explanation of (A).
(2) (A) is correct but (R) is not correct.
(3) (A) is not correct but (R) is correct.
(4) Both (A) & (R) are correct and (R) is the correct explanation of (A).

70. Given below are two statements: one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A) : The companion cells help in maintaining pressure gradient in sieve tubes.

Reason (R) : The sieve tube elements and companion cells are connected by pit fields present between their common longitudinal walls.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) Both (A) & (R) are correct but (R) is not the correct explanation of (A).
(2) (A) is correct but (R) is not correct.
(3) (A) is not correct but (R) is correct.
(4) Both (A) & (R) are correct and (R) is the correct explanation of (A).

71. Given below are two statements: one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A) : In dicot stems, vascular bundles are said to be open.

Reason (R) : In dicot stems cambium is present between phloem and xylem.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

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(1) Both (A) & (R) are correct but (R) is not the correct explanation of (A).
(2) (A) is correct but (R) is not correct.
(3) (A) is not correct but (R) is correct.
(4) Both (A) & (R) are correct and (R) is the correct explanation of (A).

72. Given below are two statements: one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A) : The amount of secondary phloem produced is more than secondary xylem and soon forms a compact mass during secondary growth in dicot stems.

Reason (R) : The cambium in dicot stems is generally more active on the inner side than on the outer.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) Both (A) & (R) are correct but (R) is not the correct explanation of (A).
(2) (A) is correct but (R) is not correct.
(3) (A) is not correct but (R) is correct.
(4) Both (A) & (R) are correct and (R) is the correct explanation of (A).

73. Identify the correct set of statements :

(a) Both apical meristems and intercalary meristems are primary meristems because they appear early in life of a plant and contribute to the formation of the primary plant body.
(b) Parenchyma consists of cells which are much thickened at the corners due to a deposition of cellulose, hemicellulose and pectin.
(c) The sclerenchyma performs various functions like photosynthesis, storage, secretion.
(d) The sclerenchymatous fibres are thick walled, elongated and pointed cells, generally occurring in group, in various parts of the plant.
(e) Tracheids are living cells with protoplasm.

Choose the correct answer from options given below :

(1) (a), (b) & (d) only (2) (a) & (d) only
(3) (b), (c) & (e) only (4) (b), (c) &(d) only

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74. Identify the correct set of statements :
(a) Phloem in angiosperms is composed of sieve tube elements, companion cells, phloem parenchyma and phloem fibres.
(b) Phloem parenchyma is made up of elongated, tapering cylindrical cells which have dense cytoplasm and nucleus.
(c) Phloem fibres are generally absent in secondary phloem but present in primary phloem.
(d) Xylem fibres of jute, flax and hemp are used commercially.
(e) The stomatal pore, guard cells and the surrounding subsidiary cells are together called stomatal aperture.
Choose the correct answer from options given below :
(1) (a) and (b) only
(2) (c), (d) and (e) only
(3) (a), (b), (c) and (d) only
(4) (a), (b) and (c) only

75. Identify the correct set of statements :
(a) The tangential as well as radial walls of the endodermal cells have a deposition of water impermeable, waxy material lignin in the form of casparian strip.
(b) In dicotyledonous roots there are usually two to four xylem and phloem patches.
(c) In monocot stem the cells of the endodermis are rich in starch grains and the layer is also referred to as the starch sheath.
(d) In dicot leaves, certain adaxial epidermal cells along the veins modify themselves into large, empty, colourless cells. These are called bulliform cells.
(e) The activity of cambium is under control of many physiological and environmental factors.
Choose the correct answer from options given below :
(1) (a) only
(2) (b) and (e) only
(3) (a), (b) and (e) only
(4) (a), (c) and (d) only

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76. Identify the correct set of statements :
(a) The cork is impervious to water due to water due to suberin deposition in the cell wall.
(b) Lenticles permit exchange of gases between the outer atmosphere and the internal tissue of the stem. These occur in most herbaceous plants.
(c) Sapwood does not conduct water but it gives mechanical support to the stem.
(d) In dicot root, the vascular cambium is completely secondary in origin.
(e) Bark is a non-technical term that refers to all tissues inner to the vascular cambium.
Choose the correct answer from options given below :
(1) (a), (c) & (d) only (2) (b), (c) & (e) only
(3) (a) only (4) (a) and (d) only

77. Given below are two statements: one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.
Assertion: Cambium is a lateral meristem and cause growth in width.
Reason: Cambium is made up of fusiform and ray initials in stem.
(1) If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.
(2) If both Assertion and Reason are true but the Reason is not the correct explanation of the Assertion.
(3) If Assertion is true but Reason is false.
(4) If both Assertion and Reason are false.

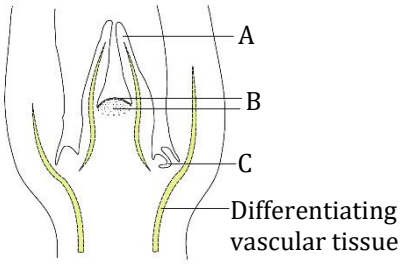
78. Given below are two statements: one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.
Assertion : Vessels are more efficient for water conduction as compared to tracheids.
Reason : Vessels are dead and lignified.
(1) If both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.
(2) If both Assertion and Reason are true but the Reason is not the correct explanation of the Assertion.
(3) If Assertion is true but Reason is false.
(4) If both Assertion and Reason are false.

79. In the given columns, column I contain structures of female reproductive system and column II contain its feature.
Select the correct match.

A.	Lateral meristem	I	Fascicular vascular cambium, interfascicular cambium and cork cambium.
B.	Apical meristem	II	Produces dermal tissue, ground tissues and vascular tissue.
C.	Bast fibres	III	Generally absent in primary phloem but found in secondary phloem
D.	Sap wood	IV	Involved in the conduction of water and minerals from the root to leaf

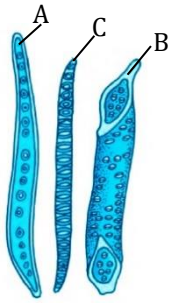
(1) A – I, B – II, C – III, D – IV
(2) A – III, B – I, C – II, D – IV
(3) A – I, B – IV, C – III, D – II
(4) A – II, B – IV, C – III, D – I

80. Identify A, B and C in the given figure of shoot apical meristem



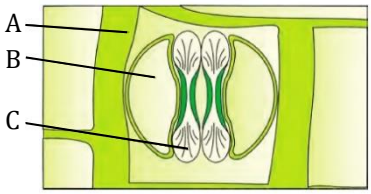
(1) A – Leaf primordium, B – Shoot apical meristem, C – Axillary bud
(2) A – Leaf primordium, B – Shoot apical meristem, C – Apical bud
(3) A – Root hair primordium, B – Root apical meristem, C – Axillary bud
(4) A – Root hair primordium, B – Root apical meristem, C – Terminal bud

81. The given figures are types of elements (A and B) which constitute one type of complex tissue (c) of a plant. Identify A, B and C.



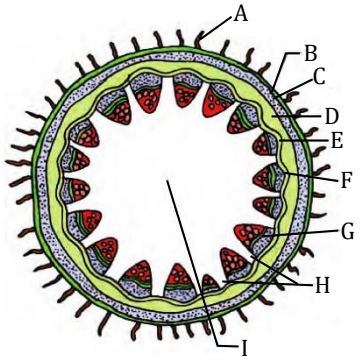
(1) A – Tracheid, B – Vessel, C – Xylem
(2) A – Vessel, B – Tracheild, C – Phloem
(3) A – Fibre, B – Tracheid, C – Bark
(4) A – Fibre, B – Sclereid, C – Casparian strips

82. The given diagrams show stomatal apparatus in dicots and monocots. Which one is correct option for A, B and C?



(1) A – Epidermal cells; B – Subsidiary cells; C – chloroplast
(2) A – Guard cells; B – Subsidiary cells; C – Stomatal pore
(3) A – Guard cells; B – Epidermal cells; C – Guard cells
(4) A – Epidermal cells; B – Subsidiary cells; C – Guard cells

83. T.S. of dicot stem is given below, certain parts have been marked by alphabets (A – I). Choose the option which shows their correct labelling.



(1) A – Epidermis, B – Epidermal hair, C – Parenchyma, D – Starch sheath, E – Hypodermis (collenchyma), F – Vascular bundle, G – Bundle cap, H – Medulla or pith, I – Medullary rays

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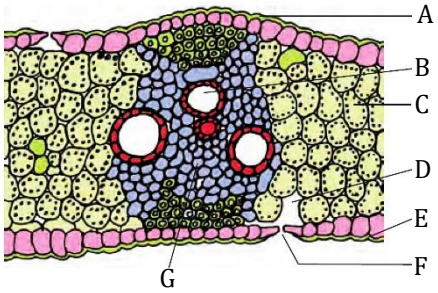
(2) A – Epidermal hair, B – Epidermis, C – Hypodermis (collenchyma), D – Parenchyma, E – Endoderm is (Starch Sheath), F – Pericycle, G – Vascular bundle, H – Medullary rays, I – Medulla or pith

(3) A – Epidermal hair, B – Epidermis, C – Hypodermis (collenchyma), D – Starch sheath, E – Parenchyma, F – Vascular bundle, G – Bundle cap, H – Medulla or pith, I – Medullary rays

(4) A – Epidermal hair, B – Epidermis, C – Parenchyma, D – Hypodermis (collenchyma), E – Starch sheath, F – Vascular bundle, G – Bundle cap, H – Medulla or pith, I – Medullary rays

84. T.S. of monocot leaf is given below, certain parts have been marked by alphabets (A – G). Which one is the option showing there correct labelling?



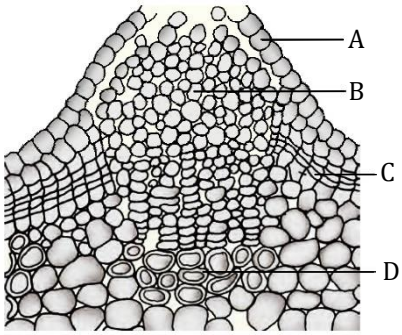
(1) A – Adaxial epidermis, B – Xylem, C – Mesophyll, D – Sub-stomatal cavity, E – Abaxial epidermis, F – Stoma, G – Phloem

(2) A – Adaxial epidermis, B – Abaxial epidermis, C – Xylem, D – Sub-stomatal cavity, E – Stoma, F – Mesophyll, G – Phloem

(3) A – Adaxial epidermis, B – Phloem, C – Mesophyll, D – Sub-stomatal cavity, E – Abaxial epidermis, F – Xylem, G – Stoma

(4) A – Adaxial epidermis, B – Xylem, C – Stoma, D – Sub-stomatal cavity, E – Abaxial epidermis, F – Phloem, G – Mesophyll

85. Which one of the followings option shows the correct labelling of the parts marked as A, B, C and D in the given figure of a lenticel?



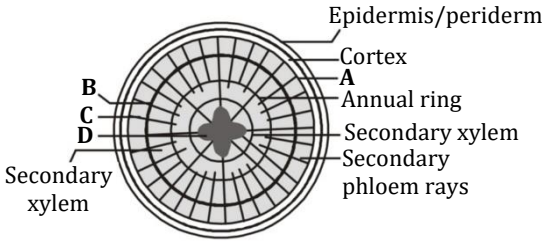
(1) A – Epidermis, B – Secondary cortex, C – Cork cambium, D – Cork

(2) A – Pore, B – Cork cambium, C – Secondary cortex, D – Cork

(3) A – Pore, B – Cork, C – Complimentary cells, D – Cork cambium

(4) A – Epidermis, B – Complimentary cells, C – Cork cambium, D – Secondary cortex

86. Which one of the following option shows the correct labelling of the parts marked as A, B, C and D in the given figure of a typical dicot root?



(1) A – Primary phloem, B – Vascular cambium, C – Secondary phloem, D – Primary xylem

(2) A – Secondary phloem, B – Vascular cambium, C – Primary phloem, D – Primary xylem

(3) A – Primary phloem, B – Primary xylem, C – Secondary phloem, D – Vascular cambium

(4) A – Secondary phloem, B – Primary xylem, C – Primary phloem, D – Vascular cambium

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Exercise - III ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	2	4	3	4	4	4	4	4	2	3	3	2	4	2	4
Question	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Answer	2	2	1	1	3	2	2	1	3	4	2	2	3	1	4
Question	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Answer	4	4	3	2	4	2	2	4	2	1	1	2	3	4	3
Question	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Answer	3	2	3	3	1	4	3	4	2	3	1	4	2	4	2
Question	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Answer	4	1	1	1	4	2	3	3	2	1	4	3	2	1	2
Question	76	77	78	79	80	81	82	83	84	85	86				
Answer	4	2	2	1	1	1	4	2	1	4	1				